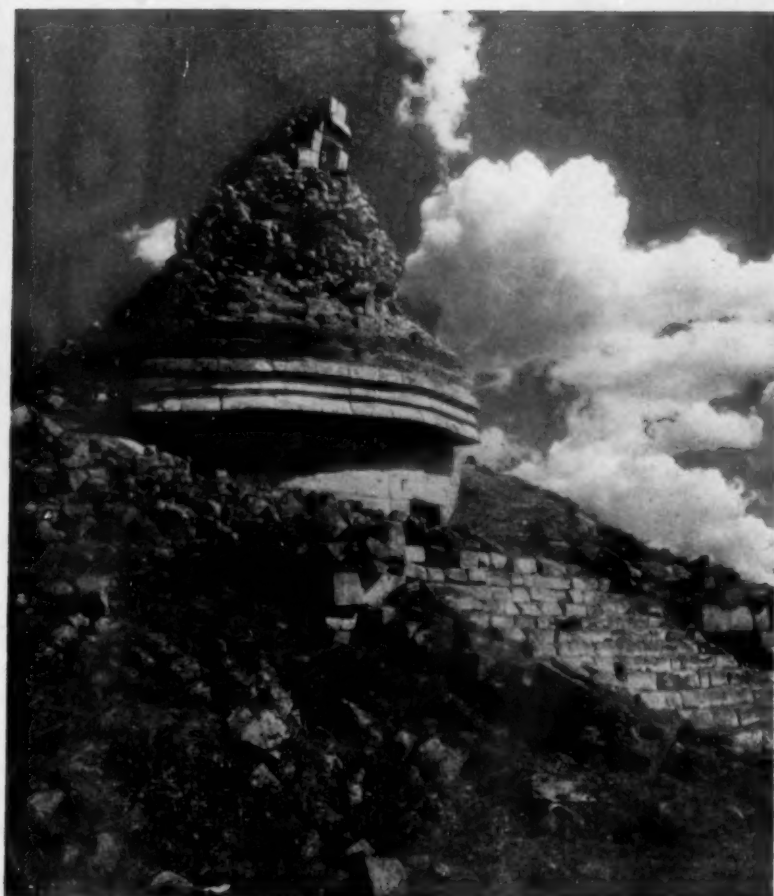


AUG 15 1931

# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



AUGUST 15, 1931

Astronomical Observatory or Bloody Altar?

See Page 102

SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

VOL. XX

No. 540

The Weekly  
Summary ofCurrent  
Science

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## SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Science, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

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## DO YOU KNOW THAT

Distant ancestors of the horse, that lived in early geologic times, were no bigger than small dogs.

The Dutch elm disease, which made its first appearance in the United States in 1930, is spread from tree to tree by an elm-bark beetle, it is supposed.

A scientist from the University of Leyden is in the United States studying collections of Egyptian coffins in museums and transcribing the religious texts on them.

The so-called flying squirrels are really gliders, gliding from a higher to a lower point by aid of a membrane along the side of the body.

Scientists are working to produce a linguistic atlas of the United States, showing regional pronunciations, spellings, and word usages.

A manufacturer is making automobile wheels of bright metal, that shine to rival head light rims and other metal trim of automobiles.

A scientist of the U. S. Coast and Geodetic Survey declares that there is a foundation for the belief that the winter climate of northeastern United States could be moderated by changing the course of the Gulf Stream.

Nurses and mothers should not hold babies always in one arm, but should shift positions, so as to strengthen the baby's muscles more evenly.

A new stethoscope instrument, for examining the lungs by listening to the breathing, works by electricity and produces a chart showing the condition of the lungs graphically.

That lawyers should be required to spend a period of training in prison before appointment as prosecuting attorneys or judges in criminal courts, the suggestion made by Dr. William A. White, noted psychiatrist.

Manufacturers of a moderately priced Italian automobile plan to introduce cars with engines burning oil, instead of gas which is expensive in Italy.

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Science Service presents over the radio, an address

## ANIMAL GRAFTING

By Prof. H. H. Collins, of the department of zoology, University of Pittsburgh

Friday, August 21, at 2:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

## PHYSIOLOGY

# New Blood Test May Decide Doubtful Parentage Cases

Reactions of Blood to Foreign Bodies Is Basis of Test Which Scientists Have Applied to Tracing of Kinship

CASES of doubtful parentage of children, such as agitate the courts from time to time, may possibly be decided with more certainty in the future, if a new blood test originated by two British scientists is developed to a point that now appears possible. The first experiments leading to the new technique were performed on cattle in Egypt by Dr. C. Todd and Dr. R. G. White, and further researches were conducted on fowls in England, by Dr. Todd working alone.

The test depends on the reactions of blood to foreign bodies that get into it. Blood invaded by germs, blood corpuscles of another animal, or anything else that does not belong there, generates substances to fight against the invaders. These substances are known to scientists by the general name of "antibodies." The familiar antitoxins used against various diseases belong to the antibody classification.

## Attacked by Antibodies

Foreign corpuscles that find their way into the blood stream are attacked by two different types of antibody. One of them tends to dissolve the outsiders, and is called a "hemolysin," or simply "lysin." The other makes them stick together in clumps, and is called an "agglutinin." Both lysin and agglutinin reactions were used by the two British scientists in their researches, the former in the cattle work, the latter in the work on fowls.

Following hints contained in earlier researches, Dr. Todd and Dr. White first found that antibody reactions are not the same if corpuscles from different animals are used with the same blood sample, and that conversely blood corpuscles from the same lot will dissolve less readily in one individual's blood serum than they do in another's.

The key to their discovery came when they found it was possible to "exhaust" the antibody in a given preparation of sensitized serum. By adding considerable quantities of corpuscles from one individual to such a serum sample, a point is finally reached where that serum will no longer have any effect on cor-

puscles from that particular source; though it will continue to destroy any other corpuscles that are added to it.

To do away with the large individual differences in reactions of separate lots of serum, Dr. Todd and Dr. White prepared what they called "polyvalent" sera, by mixing together sensitized sera from a large number of different animals. This ironed out the individual variations, and made the mixture about equally effective against all corpuscles of the species used in its production.

When now such a polyvalent serum was "exhausted" with corpuscles from a single individual, it became highly selective, sparing those corpuscles only and destroying all others, except that in some instances it was not so destructive to blood corpuscles from animals nearly related to the test specimen.

The possibility of testing blood relationship was thought of by Dr. Todd when he was working on his fowls in England. He bred three different families of chickens, and tested blood ob-

tained from the chicks against the corpuscles of their parents. In all cases but one, there was a strong "family reaction," the blood corpuscles of both parent fowls combined reacting toward the chick serum as the chick's own corpuscles would. Taken separately, either paternal or maternal corpuscles might fail to react; though where one failed the other always reacted. Thus a negative test would not necessarily indicate that parenthood could be denied, but a positive test would definitely mean that the individual so reacting, and none other, could be the parent.

So sure was Dr. Todd of the validity of his test that in the one case that failed, he tried the "errant" chick's blood against the parental corpuscles in his two other fowl families. It fitted one of these, and he concluded that there had been a mistake in marking the eggs before hatching.

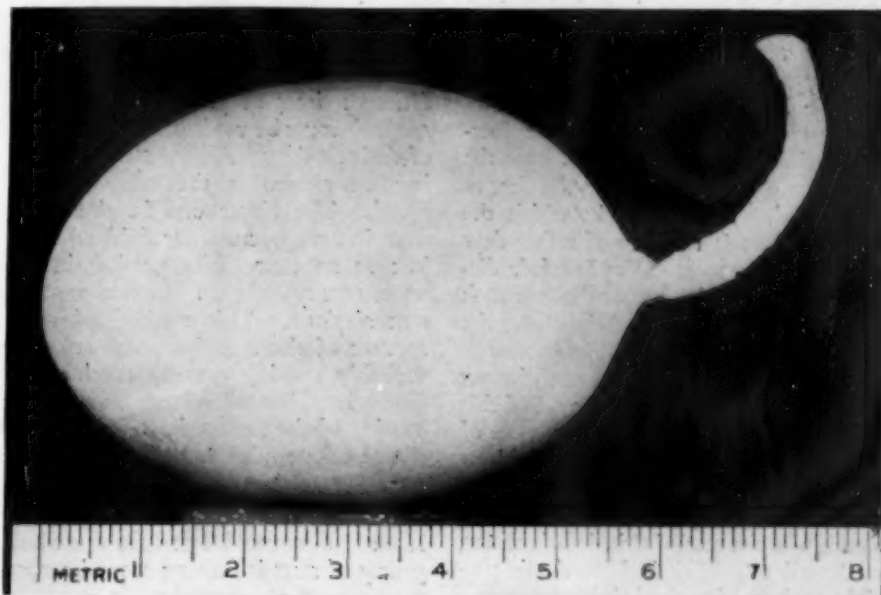
Science News Letter, August 15, 1931

## BIOLOGY

## Hen's Egg Grows Handle More Than Inch Long

A HEN'S EGG with a peculiar handle-like appendage is California's latest scientific curiosity. It was studied by Prof. Bruce M. Harrison, biologist at the University of Southern California.

Extending like a tail from the large end of the egg, which was otherwise normal in size and shape, the appendage measured nearly an inch and a half



EASY TO PICK UP

Or so one would suppose if he came across an ordinary egg with a neat handle attached. This strange appendage occurred on an egg from a chicken ranch of San Gabriel, California. It is covered with shell and definite enough. But the mystery still remains as to who the mother is.



in length and over an eighth of an inch in diameter.

Microscopic and other investigations by Dr. Harrison showed that the appendage was caused by an excess of twisted white albumen or white of the egg, and that the chalaza, one of the albuminous threads within the egg used to keep the yolk in proper position, had extended outward during the egg's for-

mation. The appendage was covered with shell and was hollow at its outer end because the albumen had shrunk some within the egg.

The unusual egg was laid at a chicken ranch at San Gabriel, Calif., but the mother of the egg kept her anonymity among a flock of a hundred white leg-horns.

*Science News Letter, August 15, 1931*

#### ASTRONOMY

## Yard Stick For Measuring Stars May be Twice Too Long

SOME ASTRONOMICAL distances that have been accepted as correct may be too large. Researches of Dr. B. P. Gerasimovic, a Russian astronomer who has been working at the Harvard College Observatory, indicate that distances determined by what is known as the Cepheid method should be reduced to about five-eighths of the values formerly adopted. A distance of a hundred thousand light years, or a hundred thousand times the six trillion miles that a beam of light travels in a year, for instance, should be reduced to the more modest figure of 63,100 light years.

The Cepheid method is based on a discovery made at the Harvard Observatory in 1908 by Miss Henrietta S. Leavitt, who died in 1921. It relates to a peculiar kind of variable star that periodically varies in brightness. Unlike other types of variable stars, a Cepheid variable has a rapid rise to maximum brightness, followed by a more deliberate decline. The name comes from the star delta Cephei, which was the first to be studied. The period in which the change occurs is a matter of a few days or a week or more. Miss Leavitt's discovery was that the longer the star took for a return to greatest brightness, the greater was its average brightness.

Dr. Harlow Shapley, present director of the Harvard Observatory, applied this discovery to determining the distance of the Cepheids, and hence of other objects with which they are associated. Since the period, in days, bears a direct relationship to the star's intrinsic brightness, or "candlepower," it is theoretically possible to determine the brightness of one by merely measuring the time it takes to make a complete change in brilliancy. When the candlepower, or "absolute magnitude" is thus measured, as well as the apparent magnitude by noticing how

bright it appears in the sky, the distance can be found, because the light diminishes with distance.

In this way it is possible to tell the relative distance of the Cepheid stars, but in order to get actual figures in miles, the distance of some, at least, must be found independently. The distances to these standard stars form the yardstick by which the more distant ones are measured. According to Dr. Gerasimovic this yardstick is almost twice as long as it should be, and if the yardstick is too long, the distances that we measure with it are also too long.

#### None Close Enough

Unfortunately, none of the Cepheids are close enough for astronomers to measure their distances directly, by their apparent change in position as seen from different parts of the earth's orbit, at different times of year. More indirect methods must be used, especially a study of their motions. All the stars are moving, at somewhat the same average speed. The closer one is, the faster does it sweep across our field of view, just as an automobile passing in the street may seem to go faster than a distant airplane. This method takes no account of the fact that some stars are probably moving actually much faster than others, but when large numbers are considered the average is probably pretty close to the truth.

Using the latest figures for the motions of the stars, and allowing for the recently discovered fact that the whole galaxy of stars is turning around a common center, Dr. Gerasimovic has re-determined the distances of the nearer Cepheids. These data show that the average Cepheid variable star is about one magnitude fainter than as astronomers would formerly have supposed from the



#### LIKE A BUMBLEBEE

*But nothing more than a common, harmless moth. Hairy, banded body, swift humming flight, bee-like wings, when at rest, would all mark this insect as a bumblebee. But these features are only a part of his camouflage, which is revealed by the angle of his wings and the unmistakable antennae.*

time in which its light varies. Hence the faintness is not as much due to distance as has formerly been believed, and so the Cepheids apparently must all be moved in closer to us. Star clusters and spiral nebulae whose distances have been measured from a study of their Cepheids are also closer than was thought.

*Science News Letter, August 15, 1931*

#### ZOOLOGY

## Cats, at Least Big Ones, Don't Land Feet First

CATS DO NOT always land on their feet, Jay Bruce, mountain lion hunter, has reported to the California Fish and Game Commission.

Bruce based his statement on a recent lion hunt. He and his trained dogs had treed a huge male lion in the Silver Creek country. The big cat, which weighed 160 pounds and measured 7½ feet from nose to tip of tail, climbed to the 60-foot level in the tree and was attempting to get higher when it lost its footing and hurtled downward.

While falling it made several complete loops and finally landed squarely on its back. The force of the blow made it unconscious for several seconds, but it soon came to and counter-attacked the dogs. Then its career was ended by a pistol-shot.

*Science News Letter, August 15, 1931*

## AERONAUTICS

# World's Largest Airship Being Prepared For Flights

New Design Will Enable Dirigible to Move Vertically  
While Triple Keels Impart Greater Strength Against Wind

THE U. S. Navy's Akron, an air cruiser and the largest lighter-than-air craft in the world, was christened by Mrs. Hoover at Akron Saturday and will take to the air for trial flights within the next few weeks.

The huge rigid airship is nearly twice as large as the Graf Zeppelin, having a gas capacity of 6,500,000 cubic feet, while the capacity of the Graf is 3,700,000 cubic feet and of the Los Angeles, 2,470,000 cubic feet. The ship has a length of 785 feet and a maximum diameter of 132.9 feet.

Carried up by non-inflammable helium gas, of which America has a monopoly, the Akron will exert a gross lift of 403,000 pounds and a useful lift of 182,000 pounds. And powered by eight Maybach engines capable of attaining 4,480 horse-power she will be able to reach a maximum speed of 84 miles per hour. At a cruising speed of 50 miles per hour, engineers have estimated that the ship will travel 10,580 miles without refueling.

Thus, because of her size, the Akron will greatly exceed all airships. New features of construction also give her additional advantages. For example, instead of one keel she has three which strengthen the ship to withstand vertical air currents.

## Reduces Air Resistance

All engines are within the bloated cigar-shaped framework and the propellers project 18 feet through the fabric. Thus the air resistance of protruding cabins is done away with. The engines are reversible and the propellers can be turned through an angle of 90 degrees to carry the ship vertically up and down as well as forward. By means of a condenser system enough water will be recovered from the exhaust gases to make up for the weight lost by the consumption of gasoline.

The Akron contains a hangar for small airplanes and will be able to discharge these planes and receive them again while in flight. It is also expected

that she will be equipped with a number of rapid fire guns.

Dr. Karl Arnstein and engineers who came with him from Germany designed the Akron. During the World War Dr. Arnstein had charge of the construction of some seventy military and commercial airships, many of which were used in night attacks on England. The Los Angeles, now the United States' only rigid airship, which was built by the German Zeppelin Company for this country, was also under Dr. Arnstein's direction.

*Science News Letter, August 15, 1931*



DR. ARNSTEIN

*The German designer who has just completed his 71st airship. Dr. Arnstein was in charge of construction of 68 German military and commercial Zeppelins for use in the World War. Some of them took part in the air raids against England.*

## FORESTRY

# High Winds and Drought Make Fire Control Problem Acute

UNPRECEDENTED high winds which parch the land and sweep flames along tree tops have made the fire control problem in northwest forests exceedingly acute. Western Montana and Northern Idaho are the focus of raging conflagrations which have cost homes and lives of stock, and have ruined hundreds of productive acres.

Eastern Montana is drier now than ever before, while the whole state as well as Washington, Idaho, and Oregon suffer from the cumulative effect of a drought increasing steadily for the last ten or eleven years. Lack of spring rains, according to Roy Headley, of the U. S. Forest Service, resulted in forest fires breaking out in these states in April of this year. Never before at such an early date, he said, have such destructive blazes been encountered.

During the latter part of June, some precipitation occurred in the northwest region but was quickly nullified by the intense wind and heat which dried up the moisture. Wyoming, Colorado, Utah, and South Dakota have been in the grip of the drought until recently

when some rainfall occurred, Mr. Headley said. In Arizona and New Mexico summer rains have made conditions normal. Destruction by fire has been reported in forests throughout the west; since July fires have not been serious along the Atlantic coast. In general, the drought conditions and resulting fires are believed to be considerably worse this year than last.

Figures from the U. S. Forest Service show that already in the national forests alone, at least 251,000 acres have been severely burned, while the total for 1930 was only 205,000 acres, and the season of fires is far from being over.

Lightning is charged with causing almost two-thirds of the fires in the Pacific northwest. Lookouts report them as soon as sighted and the rush begins to surround the burning area and prevent it from enlarging. Sometimes it is possible to look at a storm and tell whether it is the kind likely to cause a fire. Besides the natural agencies which start fires, Mr. Headley stated, the careless smoker is the worst.

*Science News Letter, August 15, 1931*



ARCHAEOLOGY

# Another Temple to the Wind God

**A Deity's Sanguinary Appetite so Horrified Cortez Soldiers That They Went About Destroying His Peculiar Temples**

By EMMA REH

**N**EAR the little Indian village of Prairieville—the Mexican name is Calixtlahuaca—archaeologists have made a rare and unusual discovery.

They have found one of those circular temples to the God of the Wind, seen by the soldiers of Cortez, but not one of which was ever afterward found on the Mexican mainland. The Aztec Wind God had his shrine atop a circular structure, so the musty old chronicles say, and the entrance to his lofty sanctuary was through a pair of horrible serpent's jaws whose grotesque fangs were painted red or smeared with the blood of human sacrifice and in whose deep throat an eternal fire burned.

So terrifying were these temples to the Spaniards who beheld them on their march of conquest through the Mexico of Montezuma, that they were the first of all the Aztec structures to be battered to the ground. They reminded the conquistadores of nothing less than hell itself, and they were sure that the devil had been the architect.

## Part of Ruined City

For this reason the finding of the remains of such a building now is of enormous interest to archaeologists. It is part of a ruined city near Calixtlahuaca which also has just been discovered, and the round temple is as yet only partly excavated. But, as the Indian workmen remove the hood of earth and vegetation that envelops it, a structure for all the world like a giant birthday cake of stone is coming into view. It is a very fancy cake, too, five layers deep, each upper layer smaller than the one it rests upon, and, as if the resemblance were not yet sufficiently striking, the ancient bakers-in-stone had put on an "icing" of plaster which still sticks in spots along the massive masonry walls.

Leading to the topmost layer of the masonry cake on the east is a stairway of stone. It is too steep for white man's comfort, as is almost always the case in Mexican pyramids, but in its heyday must have lent itself to very dramatic

religious processions to its summit. Whatever there was waiting at the top, it must have suddenly come into view only as the last step was reached.

A little probing has revealed that this ancient broken stairway was really "new," for traces of at least one other older one within exist. Aztecs and their kindred never tore a building down when it got too small for a community. They merely heaped it over with rock and earth and put a new stone facing on the outside, plastered it, rebuilt the shrine on top, and reproduced all other details, so that the newer structure was but a larger edition of the older one within. At one time, too, when the vertical walls of the lower layer showed signs of weakness, a sloping batter was added like a buttress, making this bottommost layer of the cake a slice of a cone while the others are cylindrical sections.

All sorts of idols and pottery are found scattered about the excavations by which the archaeologists expect to tell the story of the city's past beyond the scope of history. The most interesting object that has thus turned up is a circular stone a yard across and a half a yard high carved in Aztec glyphs that signify "blood." In fact this stone is but a smaller edition of the gigantic sacrificial altar of Montezuma now in the National Museum at Mexico City, which was once the city of Tenochtitlán.

Ancient Calixtlahuaca was probably not Aztec in the beginning, but rather built by other Mexican Indians, Tarascans, or perhaps Otomi, whose archaeology is not yet well understood by archaeologists themselves. The city was built on the slopes of a low ridge of mountains, the various pyramids and mounds standing on artificial terraces connected by great causeways that were once paved in stone. This ruined site is one of the world's highest cities, ancient or modern, for it stands 8,500 feet above sea-level. It lies in the Valley of Toluca, west of Mexico City. Modern Calixtlahuaca, the Indian village on the edge of the ruins, is an enigma today, for its handful of inhabitants speak Aztec while all the other surrounding

villages for many miles do not understand them for they speak dialects of Otomi.

The Calixtlahuaca hillsides were inhabited over an enormous period of time, judging by the evidence of pottery and such tell-tale remains from at least five successive types of people, from the most primitive of "Archaic" folk to the highly sophisticated, if bloodlike, Aztecs of later times. The heavy Aztec hoof is everywhere seen, for the circular temple to the Air God is theirs, and so is the butcher stone, and many other things. Like all imperialistic peoples the Aztecs forced their arts, customs, and religion upon their victims.

## Conquered and Overhauled

In the middle of the fifteenth century, Calixtlahuaca was conquered and overhauled by Axayácatl, the emperor of Tenochtitlán, the city-on-the-lake that was later to become Mexico City. A few years before the Spanish Conquest of 1521, in the reign of the last of the Montezumas, Yocoyótzin, whom Cortez was later to imprison and depose, Calixtlahuaca was razed, and the rightful owners driven away. A garrison of Aztec soldiers was placed there instead as an outpost of the empire, and the isolated handful of Aztecs there today are



THE WIND GOD

Otherwise known as Quetzalcoatl and the Plumed Serpent, in whose honor the Aztecs made many human sacrifices.

probably the descendants of those American "Romans." That is about all that history knows.

Archaeologists have always been interested in one famous example of round temples in Mexico, the "Caracol" or "Snail-shell" of Chichen Itza. This is in the peninsula of Yucatan, a thousand miles east of Calixtlahuaca, and across the Mexican Gulf. It is in the distant land of the Mayas, but not far enough away for the imperialism of the conquering hordes from the Mexican mainland.

The Caracol of Chichen is a great white circular tower whose superposed layers recede in size to the top. Some of the walls are broken and this has a spiral effect. It resembles somewhat a snail-shell.

Not because it looms into the skies for almost a hundred feet, but because the windows in the topmost turret seem to have been deliberately placed for accurate observation of the sun at different stations of the tropical year, was it called the "Mayan astronomical observatory," by Carnegie Institution archaeologists now working there.

Bishop Landa, writing shortly after the Spanish Conquest of Yucatan, in the middle of the sixteenth century, when he still had the opportunity to learn a lot of Mayan lore direct, says that Quetzalcoatl, the God of Air, otherwise known as the Plumed Serpent, came from the Mexican mainland and conquered Yucatan. He built himself a magnificent round temple in Chichen Itza. When the conquering Mexican band built the city of Mayapan a little north of Chichen Itza, another such round temple was constructed there. The Mayapan round temple does not exist today for it was destroyed by lightning in 1867. But a sketch made before, shows it was modeled after the "Snail" of Chichen.

#### Hidden Chambers Suggested

A third round building was discovered, also in Yucatan, by Dr. Herbert Spinden of the Brooklyn Museum, in the Mayan maritime town of Palmul on the Caribbean coast. The building is in four round receding sections, the uppermost turret having a room with windows. From fissures behind a ruined altar come currents of cold air, suggesting hidden chambers.

The fourth and last of the round buildings known in the Republic of Mexico, is one much earlier by thousands of years, and built long before Quetzalcoatl was born. It is at Cuicuil-



#### PRAIRIEVILLE'S TEMPLE

*To the God of the Wind—a rare and unusual discovery. The soldiers of Cortez, terrified by the horrors committed within these temples, destroyed all they could find. The famous Caracol, or snail shell temple, at Chichen Itza, Yucatan, which is thought to be another of the round temples to the Wind God, is shown on the front cover.*

co, "The Place of Singing" near Mexico City. It sits in a thirteen-mile lava sheet that conservative estimates put at at least three thousand years. The molten lava that flowed from a crater's mouth on the horizon partly inundated the round structure, at places to a depth of 25 feet.

That burning sheet not only sealed in the proof of antiquity in the case of this mysterious "round pyramid," but also formed an American "Pompeii" where one may see today bits of life as it was in the Valley of Mexico 2,000 years before the time of Christ.

The Cuicuilco structure is not tall and majestic as is its nearest round neighbor at Calixtlahuaca, but looks more like a stack of lowly "wheats" than like an aristocratic cake. And the volcano poured its lava syrup generously around. The Cuicuilco structure is by far the most primitive of the four, but nothing is known of its past, and all racial memory of its history has faded.

The Air God, or Quetzalcoatl, to whom the other three round temples were built, stood with the Mexicans something as Christ stands in the Christian world, in some of his aspects, at any rate. He appears to have been a great popular leader who lived on in myth after his death. He was an exceedingly human sort of god, and at one time got very drunk. It was a lady that plied him with pulque, led him

astray and caused him to lose his power among his people. That, however, did not prevent his soul from ascending to the Evening Star, when he died.

#### Saint Thomas in America

Quetzalcoatl is represented in many guises in ancient chronicles, for he had many jobs on earth. In one guise he was a "fair god" with blue eyes and light hair. He was variously explained by Christian conquerors who heard this tale. Some said he was a Norseman drifted by chance to the Mexican coast, where he gained renown and power, but the strangest version, and one held for many generations after the Conquest, was that Quetzalcoatl was really Saint Thomas who had wandered into the American wilderness, and became a god in Mexican legend.

The temples that were later built to him were round, because as God of the Air, his most important job, he must have them round. One Mexican Colonial historian says that their shape was round because as air circulates around all, so the temple of the Air God had to manifest his qualities.

*Science News Letter, August 15, 1931*

Illiteracy in the United States has been reduced to a point where fewer than five persons out of every 100 over 10 years of age are now unable to read and write.



## ARCHAEOLOGY

**New Type of Stone Age Tools Discovered in Africa**

**A** NEW TYPE of stone-bladed tools that were used by Stone Age men and women thousands of years ago has been discovered in South Africa and reported to the Royal Society of South Africa.

C. Van Riet Lowe, who announced the discovery, stated that the stone implements were found during exploration at Mazeppa Bay, near the mouth of the Kogha River.

The implements are numerous, and are pronounced of a kind hitherto unrecorded in scientific data. They represent a distinct stage in Stone Age industry, it appears. Some of the implements are long, blade-like shapes. Some are scrapers, graters, and points. But the most characteristic specimen is like a giant crescent. It is shaped like a quarter of an orange, with the flat surfaces forming the cutting edge.

Previously, a single specimen of these crescent-shaped implements had been found, and this original specimen had been thought to be unassociated with any particular type of Stone Age culture. The new discovery shows that the crescents were standard equipment for Stone Age people of the newly explored region.

*Science News Letter, August 15, 1931*

## FORESTRY

**Hurricane Helps Explain "Compression Wood"**

**"IT'S AN ILL WIND** that blows nobody good"; and this applies even to hurricanes.

For years foresters have sought an explanation of the occurrence of "compression wood" in vertically growing conifers, or evergreen trees. The 1926 Florida hurricane now promises to greatly aid in solving the mystery.

Compression wood is an abnormal type of wood that occurs to a greater or less degree in all coniferous trees. The most outstanding characteristic of compression wood is its excessive longitudinal shrinkage, which has been found to be from three to 35 times that of normal wood. This characteristic frequently is responsible for bowing, splitting, and twisting of softwood lumber.

Compression wood is readily distinguishable from normal wood by its relatively wide annual growth rings and

by its "lifeless" appearance. It commonly occurs on the lower, or compression side, of branches and leaning trees. Occasionally, however, vertically growing trees are found in which compression wood has grown first on one side of the tree and then on another, but in such trees the compression wood is in only one part of any one annual ring. How to account for this variation puzzled the foresters.

M. Y. Pillow, of the U. S. Forest Products Laboratory, examined 50 long-leaf pines from western Florida for compression wood. He found that compression wood had formed abruptly in 1926, which, according to theory, indicated that the trees had been bent over during that growing season. It is known that the hurricane of September 20, 1926, passed over the region in which the 50 trees grew. All the trees that had suddenly formed compression wood in 1926 continued to form it in 1927, but, in 1928 it did not form in some of the trees and had greatly diminished in others.

*Science News Letter, August 15, 1931*

## BOTANY

**Seeds of Rubber Tree Yield Feed for Livestock**

**S**EEDS of the Para rubber tree yield an oilcake and meal that is good feed for livestock, experiments at the Virginia Experiment Station, University, Va., indicate. Earlier reports from the East Indies stated that the seeds are poisonous to farm animals, but this claim has not been borne out in the tests at the University. The rubber seed oil meal analyzes 33 per cent. protein and six per cent. fat, besides non-nutrient constituents. Cattle and sheep are said to relish it.

The question of the suitability of the oil meal has come up as the result of experiments on the production of a commercial oil from the seeds of rubber trees on East Indian plantations, initiated by an American chemist, E. D. Gothwaite, of Belawan, Sumatra. He found that rubber seed oil can be used to advantage as a drying oil, slightly inferior to linseed and tung oils in its qualities, and that after suitable treatment it might be made available for use as human food.

The development of these products from rubber seeds is still in the experimental stage, Mr. Gothwaite has stated. It is not anticipated that large quantities of the oil and cake will be found on the market in the near future.

*Science News Letter, August 15, 1931*

**IN SCIENCE**

## ASTRONOMY

**Parts of Double Star Seen Separately for First Time**

**P**ROBABLY for the first time, the two separate stars that constitute the body called sigma Scorpii have been observed separately. Prof. Bernhard H. Dawson, of the observatory of the Argentine National University, saw them as the star emerged from occultation behind the moon. The interval between them was such that he figures their distance to be about one tenth of a second or arc, or about one eighteen thousandth the diameter of the moon in the sky. No existing telescope is powerful enough to separate such close bodies when observed in the usual way.

Sigma Scorpii has been known in the past to be a double, or binary, from a study of its light through a spectroscope. As its two components revolve around each other, one approaches the earth as the other recedes, then their roles are reversed. This causes the dark lines that appear in their spectra to separate and then come together. Many such bodies are recorded in star catalogs, but Prof. Dawson's observation is believed to be the first actually made of one component separately from the other.

*Science News Letter, August 15, 1931*

## MEDICINE

**Skin Ailment Traced To Handling Metal Money**

**A**N OBSTINATE case of eczema was traced by a Hungarian physician, Dr. Stephen Rothman, to handling too much metal money.

A communication to the American Medical Association says that the patient counted silver, nickel and copper coins for the Budapest street car company all day, and had eczema on his hands, underarms, shoulders and neck.

Tests with clean and sterile coins on the skin brought about swellings and inflammations, and the salts of these metals proved still more irritating. The patient gave up the money-counting job and was cured in four weeks.

*Science News Letter, August 15, 1931*



# ENCE FIELDS

## ARCHAEOLOGY

### Aztec Poet Viewed City From Bathtub in Mountains

**A** NEW bathing pool said to be one of those maintained by the Virgil of the Aztecs, with the long name of Netzahualcōyotl, has been found on a mountain at Texcotzingo. Here the Aztec poet had a fine view of Lake Texcoco and ancient Mexico City from his mountain top bathtub, sure in his isolation that he could not be seen.

The site has been little studied by archaeologists. It is a complicated system of pools of different levels, water conduits, stairs, courts, and terraces of stone. The new "bathtub" is the fourth of its kind found. It is round, built of stone, and frogs of stone sit on its edge. Clay idols found there in the past suggest that the site might have been connected with some Aztec sex cult.

*Science News Letter, August 15, 1931*

## ENTOMOLOGY

### Bees Like a Regular Life And Object to Change

**B**EES are very methodical little spinsters; they like to go through a regular routine of jobs during their active lives, and will adapt themselves to another order of things only if they have to.

This has been learned by a Berlin entomologist, Dr. G. A. Rösch of the Berlin Agricultural high school. In his first observations he found that bees go through a regular cycle of occupations during the 35 days of their normal lives in summer. For the first three days after they emerge as adults they are chambermaids, cleaning up the brood-cells. Then they become nurses, feeding the older larvae honey and pollen.

When they are six days old, they graduate to the class of infant nurses, and feed the younger larvae. They cannot do this at first because certain food-producing glands in their heads are not yet developed, and the secretions of these are needed as infant food.

During the second week, after the duties of nurse have been accomplished,

the young workers have a varied routine of cleaning up the hive and mounting guard. During this time they grow the wax glands on their bodies, which enable them to take their turn as builders of the comb. They also make their first flights, but gather no honey or pollen; these first flights are merely orientation "jumps."

At last, at the age of about three weeks, they are ready to go out as full-fledged foragers. They continue this occupation during the remainder of their lives, which are seldom more than six weeks long.

*Science News Letter, August 15, 1931*

## MEDICINE

### Fevers Given Children To Check St. Vitus Dance

**F**EVERS, used these days to burn out certain ailments of the human system, now seem to check St. Vitus dance in children.

Twenty-four children have been treated by fevers artificially produced by manufactured serum. Dr. Lucy Porter Sutton, working in Bellevue Hospital in New York City, reported these cases to the American Medical Association. The average time of the children in the hospital was nine days. Sixty-three cases used for comparison treated by other means stayed on an average of forty-seven days in other hospitals. The usual treatment is rest and quiet.

Dr. Sutton used typhoid-paratyphoid serum because it gave fevers for successive days which promptly stopped the symptoms. The discovery was an accident. Dr. Sutton was treating an extreme case of St. Vitus dance in a boy. He was given a drug as a sedative. It had no beneficial effect and only aggravated the disease. But through a misunderstanding the drug was not stopped until the thirteenth day when a rash and a fever developed. This was traced to poisoning from the drug. It was noted however, that the disease abruptly improved, after an irregular fever that rose as high as 106.4 degrees. A consideration of various factors convinced Dr. Sutton that it was the fever that cured.

She then tried small doses of typhoid serum because it was a safe and simple way of giving fever, and found it effective in cases tried. Later, typhoid-paratyphoid serum was chosen because it was a still simpler, safer, and cheaper way of giving fever.

*Science News Letter, August 15, 1931*

## ETHNOLOGY

### California Tribe Features Nose Rings at Weddings

**I**N THESE civilized United States, there exists today an Indian tribe whose marriage ceremony requires not that the bride have a ring put on her finger, but that the groom have a ring put through his nose.

The tribe is the Kamia, living in Imperial Valley in southeastern California. No youth may marry until he has had his nose pierced. The ceremony takes place when a boy is about fifteen years old, and not less than four youths may be operated upon at one time. If but three boys want to marry, there is no ceremony, resulting in no weddings.

When the young Indians want to marry, they obtain their parents' consent, and the Chief's "policeman" calls late at night and escorts them into the brush. Here four operators, using wooden needles, pierce the boy's noses. Immediately after the piercing, the boys must run fifteen miles each, after which they stay at the place of operation for four days. During this period the youths are restricted to a diet of corn mush and watermelons. Women stay nearby and sing continuously.

After the fourth night, the youths go home, where they must stay naked for a month, and may eat no fish, deer or jack-rabbit. The hole in the nose is kept open by a small circular stick, in order that appropriate rings may be inserted for the wedding ceremony.

*Science News Letter, August 15, 1931*

## STATISTICS

### Tuberculosis Death Rate Less In Spite of "Flu"

**I**N SPITE of influenza and unemployment which always boost it, the tuberculosis death rate is six per cent less for the first half of 1931 than the record low point reached last year, statisticians of the Metropolitan Life Insurance Company report. Diphtheria dropped 35 per cent in fatality. Whooping cough was a little less fatal, but scarlet fever and measles deaths increased. The year 1931 so far has had more influenza and pneumonia, and the rise in the cancer death rate has been particularly disturbing. The diabetes death rate is up, also heart disease and cerebral hemorrhage. Violent deaths from suicide, homicide and automobile accidents have increased.

*Science News Letter, August 15, 1931*

ASTRONOMY

# The Moons of Mars

## "A Classic of Science"

### Two Satellites of "The Moonless Planet" Discovered by Asaph Hall and Named for the Steeds of the God of War

OBSERVATIONS AND ORBITS OF THE SATELLITES OF MARS. With Data for Ephemerides in 1879. By Asaph Hall. Washington: Government Printing Office, 1878.

IN THE SPRING of 1877, the approaching favorable opposition of the planet Mars attracted my attention, and the idea occurred to me of making a careful search with our large Clark refractor for a satellite of this planet. An examination of the literature of the planet showed, however, such a mass of observations of various kinds, made by the most experienced and skillful astronomers, that the chance of finding a satellite appeared to be very slight, so that I might have abandoned the search had it not been for the encouragement of my wife. A more complete examination of the observations also gave some encouragement, as it showed that hardly any astronomer since the time of Sir William Herschel had made a special search for satellites. It is evident from his notes that Herschel was searching for satellites in 1783, and his failure to find any seems to have convinced astronomers that none existed; and the statement that "Mars has no moon" became current in our textbooks. The only astronomer of recent times whose doubt of the prevailing opinion was strong enough to induce him to make a thorough search for a satellite was Professor D'Arrest, formerly Director of the Observatory at Copenhagen. A reference to D'Arrest's search is made by Dr. Klein in his *Handbook of Astronomy*, vol. I, p. 140; and a more complete statement is given by D'Arrest himself in the *Astronomische Nachrichten*, vol. 64, p. 74. I inferred that D'Arrest made his search during the favorable opposition of Mars in 1862, but I am not certain that this was really the case, and perhaps D'Arrest missed the favorable opportunity; and did not make his search until 1864. D'Arrest died in June, 1875; but through the kindness of Professor

Schjellerup, the present Director of the Observatory at Copenhagen, I learned that D'Arrest's handbook shows that he made an earnest search for satellites, but failed to find any. In his statement in the *Astronomische Nachrichten*, D'Arrest assumes a distance of Mars from the earth equal to 0.52, and with an assumed value of the mass of the planet he computes the apparent elongation of a satellite that would revolve around the planet in a given number of days. He shows that a satellite at an elongation of 70' would have a period greater than the period of Mars around the sun, or greater than 687 days, and hence infers that it is useless to search beyond the distance of 70'. The fact that D'Arrest, who was a skillful astronomer, had searched in vain was discouraging; but remembering the power and excellence of our glass, there seemed to be a little hope left. The southern declination of the planet in the opposition of 1877 was, however, against us, and the chances seemed to be in favor of the powerful reflector at Melbourne.

#### Found Nothing

My search for a satellite was begun early in August, as soon as the geocentric motion of the planet made the detection of a satellite easy. At first, my attention was directed to faint objects at some distance from the planet; but all these proving to be fixed stars, on August 10 I began to examine the region close to the planet, and within the glare of light that surrounded it. This was done by sliding the eye-piece so as to keep the planet just outside the field of view, and then turning the eye-piece in order to pass completely around the planet. On this night I found nothing. The image of the planet was very blazing and unsteady, and the satellites being at that time near the planet, I did not see them. The sweep around the planet was repeated several times on the night of the 11th, and at half past two o'clock I found a faint object on the following side and a little north of

the planet, which afterward proved to be the outer satellite. I had hardly time to secure an observation of its position when fog from the Potomac River stopped the work. Cloudy weather intervened for several days. On the night of August 15, the sky cleared up at eleven o'clock and the search was resumed; but the atmosphere was in a very bad condition, and nothing was seen of the object, which we now know was at that time so near the planet as to be invisible. On August 16, the object was found again on the following side of the planet, and the observations of that night showed that it was moving with the planet, and, if a satellite, was near one of its elongations. On August 17, while waiting and watching for the outer satellite, I discovered the inner one. The observations of the 17th and 18th put beyond doubt the character of these objects, and the discovery was publicly announced by Admiral Rodgers. Still, for several days the inner moon was a puzzle.



ASAPH HALL

Professor of Mathematics, U. S. Navy, who discovered the two satellites of Mars at the close approach of that planet to the earth in 1877. He used the 26-inch telescope at the U. S. Naval Observatory, at that time one of the largest telescopes in the world.

It would appear on different sides of the planet in the same night, and at first I thought there were two or three inner moons, since it seemed to me at that time very improbable that a satellite should revolve around its primary in less time than that in which the primary rotates. To decide this point I watched this moon throughout the night of August 20 and 21, and saw that there was in fact but one inner moon, which made its revolution around the primary in less than one-third the time of the primary's rotation, a case unique in our solar system.

### Names of the Satellites

Of the various names that have been proposed for these satellites, I have chosen those suggested by Mr. Madan of Eton, England, viz:

DEIMOS for the outer satellite;  
PHOBOS for the inner satellite.

These are generally the names of the horses that drew the chariot of Mars; but in the lines referred to they are personified by Homer, and mean the attendants, or sons of Mars. These lines occur in the Fifteenth Book of the Iliad, where Ares is preparing to descend to the earth to avenge the death of his son. Bryant's translation is as follows:

"He spake, and summoned Fear and Flight to yoke.  
His steeds, and put his glorious armor on."

The Washington observations of Deimos extend from August 11 until October 31, and those of Phobos from August 17 until October 15. Both satellites were observed at the Harvard College Observatory by Mr. Leonard Waldo with the 15-inch Munich refractor; and a good series of observations of both these faint moons was made by Mr. Henry S. Pritchett at Glasgow, Missouri, with the 12 $\frac{1}{4}$ -inch Clark refractor of the Morrison Observatory. Observations of Deimos were made at several observatories in Europe: Pulkowa, Greenwich, Oxford, and Paris; and at the private observatories of Mr. Common in England and Mr. Erck in Ireland. But, so far as I know, Phobos, the inner moon, which is the brighter one, but more difficult to observe on account of its proximity to the planet, was not observed in Europe except at Greenwich and Oxford. As this moon was observed by Mr. Pritchett very near the limb of the planet with a 12 $\frac{1}{4}$ -inch Clark glass, and was seen on several nights by Dr. Draper and Professor Holden with the 12-inch Clark glass

belonging to Dr. Draper, I think the observers in Europe failed to find this moon because they did not keep up a careful and persistent search for it. Its motion is very rapid, and for a considerable part of the time it was hid by the planet. It is so close to the planet that it is a difficult object, but that it is brighter than Deimos is shown by the fact that it could be followed and observed much nearer the limb of the planet. The northern position of the European observatories would increase the difficulty of finding such faint objects, and perhaps also the inferior definition of some of the European telescopes is another reason why observers there failed to find this inner moon.

Since the series of observations at Washington is much more complete than any other, I have decided to use these alone for computing the orbits of the satellites; and afterward to compare with the resulting elements all the other observations, and to deduce from each set the correction to the mean distance of the satellite, which is the most interesting and important element. As the satellites were always in the glare of light that surrounded the planet and were faint objects, the observations were made with difficulty, and probably each observer has a constant error, which would make it difficult and unwise to unite all the observations into one mass. My own observations were made by laying the wire of the filar micrometer across the disk of the planet so as to divide this disk into two parts of equal area, as nearly as the eye could estimate, and then bisecting the satellite. On a few of the finer nights, the observation could be made with Mars in the field of view; but generally it was necessary, in order to bisect the satellite, to slide the planet out of the field. In this case, the eye-piece was slid backward and forward, and the wire of the micrometer was moved until the



(American Museum of Natural History)

### A CLOSE-UP OF MARS

From the satellite, Phobos, as the artist, Howard Russell Butler, imagines it.

bisections remained satisfactory. In the case of so large a disk as that of Mars, it would perhaps be better to insert a pair of wires that would cut off small equal segments on each side of the planet; but some of the observations were already made, and I disliked to break the continuity of my work, and experience has given me confidence in the method used. The observation of Professor Newcomb on August 18 was made in the same manner as my own; that of Professor Harkness, of the same date, by measuring from the limbs of the planet; and the observation of Professor Holden on September 23 was a measurement of the differences of right ascension and declination with the filar micrometer. The eye-piece was an achromatic one, giving a magnifying power of 400. . .

### Motion of the Satellites

The elements of the orbits of these satellites show that they both move very nearly in the plane of the equator of Mars, and the peculiarities of their areocentric motions will be readily deduced from these elements. The hourly areocentric motion of Phobos is 47°.033; and on account of its rapid motion, and its nearness to the planet, this satellite will present a very singular appearance to an observer on Mars. It will rise in the west and set in the east, and will meet and pass the outer moon, whose hourly motion is only 11°.882. The distances of these satellites from the centre of the planet are: for Deimos

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There Was Less Improvement  
In the Art of Agriculture Than  
Has Been Made Since the Rise  
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14,500 miles, and for Phobos 5,800 miles. The semi-diameter of the planet being 2,100 miles, the horizontal parallaxes of these satellites are very large, amounting to  $21^\circ$  for Phobos. The nearness of this satellite to the surface of the planet will produce apparent eccentricities in its motion, and cause it to appear as a variable star.

The size of the satellites is not well known, and perhaps the only thing we can say in this respect is the indefinite statement that they are very small. A photometric determination of their size was made by Professor Pickering, Director of the Harvard College Observatory. Professor Pickering's observations are not yet published, but I understand that his result is that the diameter of Deimos is 6 miles, and that of Phobos 7 miles. Mr. Wentworth Erck of Ireland also made a photometric determination of the diameter of Deimos, and found this diameter to be 14 miles. Mr. Erck's account of his determination is published in the *Astronomical Register* for January, 1878. Such determinations are, I think, subject to a considerable degree of uncertainty; but Mr. Erck's method gives us the means of estimating with tolerable accuracy the apparent telescopic brightness of these satellites. My own estimates of magnitudes having become uncertain by using the 26-inch refractor, Professor Eastman and his assistants, Messrs. Frisby, Skinner, and Paul, have made estimates of the magnitude of the star compared with the outer satellite on August 17, using for this purpose the  $9\frac{1}{2}$ -inch equatorial; and from these estimates I infer that Deimos at the opposition, and at its elongation was of the 12th magnitude of Argelander's scale.

*Science News Letter, August 15, 1931*

#### MARINE BIOLOGY

### Oysters Will Be Planted And "Reaped" Annually

**T**HE SOW-AND-REAP method so common to agriculture is on trial in the oyster industry. An enterprising company operating at Padilla Bay on Puget Sound will plant seed oysters from Japan about the first of each year and harvest them the following fall.

Fifty million oysters are now growing in the Padilla beds and will be ready for cocktails before long. Care will be taken not to let the oysters reach the gigantic, "beefsteak" size they would if allowed to attain their full growth.

*Science News Letter, August 15, 1931*

#### BOTANY-MEDICINE

## Ragweed Cause of Hay Fever Suffering in Late Summer

**L**ATE summer, bringing the main hay fever season, is upon us. The air is filled with the invisible plague of floating pollen, tormenting sensitive noses and starting thunderstorms of sneezes and torrents of irrepressible tears.

Why should hay fever rise to such a crescendo just about now, and hold its evil spell upon so many suffering mortals for the next month or so?

The answer is found in one word: Ragweed.

For some reason as yet unknown, more persons are sensitive to the pollen of the two principal species of ragweed, the tall and the low, than to any of the many other pollens that can and do cause hay fever suffering in others.

Between the two evil weeds it is hard to choose the worse. But perhaps the tall ragweed, because of its lustier growth and its distribution, at least as widespread as that of its low cousin, loads the air with more pollen and is therefore the more accursed.

The tall ragweed would be not such an ill plant to see, if one did not know its despicable character. To be sure, it has no gaudy bloom, like the impudent

vegetable tramp the jimsonweed; but at any rate it is tall and straight, reaching heights of from six to sixteen feet, and it masses into dense, jungly growths on rich lands left fallow, particularly on often-flooded river-bottoms. The fact that it is an annual, sprouting anew each year from last year's abundant seed, makes it particularly well adapted for the quick conquest of such places.

When the tall ragweed begins to shed its pollen, the low ragweed picks about the same time to add its quota of sneeze-provoking dust.

The low ragweed is a lesser plant than the tall, though not much if at all a lesser evil. It seldom lifts its tough, scrawny stems more than three or four feet high, and in much-tramped pastures, which it seems to delight in, it may not be taller than a foot or two. But what it lacks in height it makes up in distribution. Less particular about soil and moisture than its brother pest, the low ragweed grows in thin, dry upland soils as well as in rich bottom lands and between rows in well-watered cornfields.

A bright and lovely wild flower, that has the ill luck to come into bloom con-



**GOLDENROD**

*It starts psychological sneezes, and is unjustly accused of being a real cause of the ailment.*



**TALL RAGWEED**

*The ragweeds, both tall and low varieties, give more people hay fever than any other plant.*

spicuously when the unnoticed flowers of the ragweed are starting their annual warfare against helpless human nostrils, has had to take the blame for crimes it never committed and could not possibly commit. The goldenrod has been long and unjustly accused, and even the repeated vindications given it by physicians and botanists have not served to clear its good name in the public mind.

It is not to the point that some hay-fever sufferers aver, "But I start sneezing if I only so much as see a bunch of goldenrod." That is just it. Most cases of that sort are started by just seeing the suspected plant: the sneezes are psychological sneezes. The patient got started by ragweed or some other real troublemaker, mentally associated goldenrod with his trouble, and now he can get a grand sneezing spell just by looking at it and feeling sorry for his poor nose.

This is not saying that goldenrod does not produce pollen. It makes lots of pollen. But goldenrod pollen is the heavy grained, sticky variety of pollen produced by plants that depend primarily on insects to carry it about.

The bright color of the masses of goldenrod bloom is a further alibi; the yellow lure hung out for insects is itself evidence that the plant does not depend on broadcast sowing on the wind to get its fertilizing dust transferred.

*Science News Letter, August 15, 1931*

#### ENGINEERING

### Novel Timber Bridge Replaces Sunken Road

**T**IMBERS placed atop untreated pine piles saved the day along a two and a half mile stretch of swampy North Carolina land where the concrete road had sunk so far as to be impassable. The novel timber bridging was constructed directly over the old roadway, according to a report in the *Engineering News-Record* by W. L. Craven, bridge engineer of the North Carolina State Highway Commission.

Spaced ten feet apart, the piles were driven deep into the oozy mud in lines on both sides of the old road bed. Caps made of concrete encased the tops of the piles in order to provide a firm basis for the timber decking. A layer of asphaltic concrete covered this decking of the emergency road. While the piles were being driven it was still possible to leave a minimum of 13 feet of the old road open to traffic.

*Science News Letter, August 15, 1931*



MOSOHIPPIUS COMES TO LIFE

Thirty million years ago three-toed horses roamed the Dakota Badlands. They were not the tall, man-carrying type but were headed in that direction. Charles A. Corwin, artist of the Field Museum of Natural History, painted the background of the above picture while Frederick Blaschke did the actual modeling of the equine group.

#### ENTOMOLOGY

## Grasshopper Inroads Become Severe Along Old World Front

**W**HILE middle western farmers fight to stem the grasshopper advance, locust campaigns along the Old World front are rapidly gaining momentum. North Africa, Palestine, and other Mediterranean areas have been swept by the devouring insects, and European countries are threatened with an aerial invasion. With the insects swarming up from Guatemala and Nicaragua, locust inroads are being felt as well throughout Central America.

Cousin to the American hopper, but somewhat larger and more voracious, this Old World locust is laying waste to acreage in the millions, and, even before wing development, destroyed the entire corn crop of East Africa. Not only are grain fields and grass lands being stripped, but houses are entered and curtains and table linens attacked.

Natives of the provinces in East Africa have become organized in a union to combat the pest. Uniformity of control methods exists, but even then the struggle is against odds. These Old World locusts breed along mountain sides, high plateaus and other inaccessi-

ble areas, making it impossible to destroy the eggs they hatch. Wheat bran, the basis of the American insecticide, is not available. Spraying, digging ditches are employed to halt the pests, but in general the methods are less effective than those used in this country.

The full force of the locust plague on other continents is just beginning to be felt, according to communications received from abroad by the U. S. Bureau of Entomology in Washington. The delay, in Africa, of the heavy seasonal rains and the absence of the flocks of locust-eating storks have combined to make the pests extremely numerous.

One aspect of the war back in the United States deals with Iowa's resort to strategy. Farmers there plan to strike a death blow to the hoppers which will carry on the battle next spring.

Poison bran mash will be distributed during May and June, 1932, to kill the young grasshoppers as they emerge. This fall the fields will be ploughed carefully in order to crush the hopper eggs which are now being laid in the soil by thousands.

*Science News Letter, August 15, 1931*

## FORESTRY

**Blighted Chestnut Trees  
May Be Made Into Paper**

CHESTNUT forests now dead or dying from the blight can be salvaged twenty years hence for the tanning and paper industries, a report by the paper section of the Bureau of Standards of the U. S. Department of Commerce states.

Despite efforts to introduce blight resisting trees from Asia into this country, the spread of the disease together with the commercial exploitation of the chestnut by the tanning and paper industries indicates the ultimate exhaustion of American chestnut forests.

The day when a shortage will be felt has been postponed by many years, however, through the discovery that dead trees can be used as a source of paper and tanning. Investigations conducted by the Bureau of Plant Industry, U. S. Department of Agriculture, have revealed that dead trees suffer no appreciable loss of tannin even over long periods of time. It has also been demonstrated that dead trees can be used in paper manufacture and a paperboard mill has been built in the worst blight-infected territory with expectations of using the trees for twenty years.

"The available information undoubtedly indicates the ultimate exhaustion of our chestnut forests," concludes the Bureau of Standards report.

*Science News Letter, August 15, 1931*

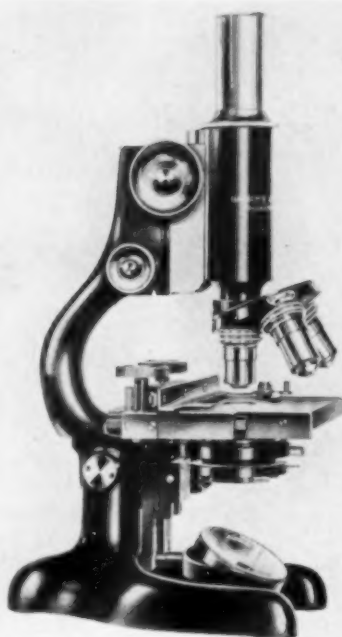
## ZOOLOGY-CHEMISTRY

**Study of Elks May Point  
Way to Managing Herds**

AN ELK antler analyzed in Yellowstone National Park is found to contain about 43 per cent. protein. The analysis was made by William Rush of the Forest Service, who has been studying the elk of Yellowstone Park under a cooperative arrangement between the National Park Service, the Forest Service, the Bureau of Biological Survey, and the Montana Fish and Game Commission. This study is expected to yield valuable data to serve as a basis for the management of the park's big elk herds.

In connection with the protein content of the antler, it is interesting to note that the 40 tons of cottonseed cake bought by the National Park Service for feeding to the buffalo this fall also contain 43 per cent. protein.

*Science News Letter, August 15, 1931*



## The Feeling of Reliability

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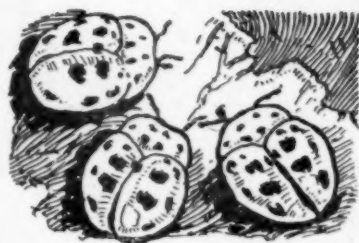
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ENTOMOLOGIST

## Nature Ramblings

By FRANK THONE



Gold-Bugs

**E**DGAR ALLAN POE established the short story as a definite and accepted form in English literature, and The Gold Bug is without doubt one of his most effective short stories. If there be, in this callous age, any young persons who have not yet read this thriller, let them do so at once and learn thereby what thin stuffs their favorite vintages of present-day mystery stories are after all.

But where Poe's gold-bug led the seekers in his story to buried wealth, the real gold-bugs that crawl and fly about our fields nowadays are destroyers of buried wealth. For one of the most troublesome enemies of the sweet potato crop is a most attractively spotted, gold-glittering little beetle about a third of an inch long. Together with its squashy, maggot-like larvae, it is found on the leaves of sweet potatoes and their relatives the morning-glories and the bind-weeds, feeding greedily.

They live through the winter as adults in dry, sheltered places, under bark or trash. They come out of hibernation rather late, and are found feeding on the plants during the earlier part of the summer.

Without doubt, the sacred scarab of Egypt would have had to look to his place in the sun, or rather to his place as the sun, had this second cousin of his, more nearly sun-colored than himself, been a resident in the Nile valley during the time of the Pharaohs. The gold-bug, however, is an American insect, as the vegetable he infests is also American, so that he missed his chance for quasi-divine honors.

*Science News Letter, August 15, 1931*

The first printed arithmetic was an Italian work published in 1478.

## LINGUISTICS

# Talks Over Telephone Made Up Largely of Word Repetition

## First Study of Wire Conversations Reveals Sounds Most Used and May Aid in Improving Transmission Apparatus

**O**NE THOUSAND people spoke, using 80,000 words, of which only 2240 were different. And of these different words, 819 were used only once. Thus 99 per cent of 80,000 words of conversation was made up of only 1421 words used over and over again many times.

Thus might be summarized findings of a study of the words and sounds of telephone conversation reported in the Bell System Technical Journal. Obviously this study, conducted by Norman R. French, Charles W. Carter, Jr., and Walter Koenig, Jr., points an accusing finger at the diminutive vocabulary of the average American, even when 500 different people pool their resources of speech. But it does more than that.

This is the first study of the frequency of speech sounds in oral English, the scientists believe. Written matter has been analyzed before and the results of these past researches supply interesting material for comparison with the study of oral speech. There is also another reason for the research. By finding what sounds are repeated most frequently, telephone engineers may work toward improving their transmission.

Observations were made on typical

toll conversations in New York City. During one week the person listening in recorded verbs only, the next week nothing but nouns, and the third week adjectives and adverbs only. Data was taken on 500 conversations each week.

Apparently, over the telephone people talk about themselves more than about any other subject, for more than 7500 of the 80,000 words were the pronouns "I" and "you." In fact, 121 different words which constitute the minor parts of speech form more than half, 45,000, of the total occurrences.

Strangely, more words of Latin origin are used in conversation than in writing. Of the 100 most frequently used words of conversation, 11 are of Latin origin as compared with only two from the first 100 written English. Twelve active verbs such as "get," "see" and "know" occur among the 50 most used words of conversation, yet are absent from the first 50 words of written English.

More than four-fifths of the conversation words were naturally monosyllables, largely a result of the frequent repetition of the minor parts of speech, of which 95 per cent are monosyllables.

*Science News Letter, August 15, 1931*

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# • First Glances at New Books

## Archaeology

**THE TEMPLE OF THE WARRIORS AT CHICHEN ITZA, YUCATAN**—Earl H. Morris, Jean Charlot, Ann Axtell Morris—*Carnegie Institution of Washington*, Vol. I, 484 p., Vol. II, 170 plates, \$20. The restoration of the Warriors' Temple has been a wonder story of American archaeology. In 1924 a mound of rock and earth in Chichen Itza showed itself to be a ruined building by the carved stones protruding from it. By 1928 the mound was changed into a strikingly beautiful limestone temple on a carved pyramid base. Mr. Morris, who put all his engineering and archaeological skill into the direction of this project, has now made his final report. The two volumes are almost as impressive as the Warriors' Temple itself. The descriptions of excavation and methods of repair are given in such precise detail as to furnish a guide to procedure in Mayan archaeology. Mr. Charlot's report on the bas reliefs, which follows, is equally full and definite. Volume one closes with Mrs. Morris' report, telling how she made water color copies of murals in the temple and adjacent buildings. Much less has been known about Mayan painting than about the sculptures of the Mayas. This careful analysis of the Indian painters' techniques and of the pictures themselves is therefore of great interest. Eighty of the plates in volume two are in color.

*Science News Letter, August 15, 1931*

## Biology

**BIOLOGY IN HUMAN AFFAIRS**—By 12 authors, edited by Edward M. East—*McGraw-Hill*, 399 p., \$3.50. Thinking people will enjoy this book which gives in non-technical terms important information on the various phases of biology as it affects the world today. The chapters are contributed by authorities in each field.

*Science News Letter, August 15, 1931*

## Public Health

**HEALTH AT THE GATEWAY**—E. W. Hope—*Cambridge University Press*, 213 p., \$5. The fascinating story of how a large seaport city protects the health of her citizens, and the evolution of the present system for doing so. The city is Liverpool and the story is told by the Professor of Public Health at the University of Liverpool who was formerly Medical Officer of Health for the city and port. In spite of the fact

that the book treats of some prosaic matters, such as filtration systems and street cleaning methods, it is interesting reading and because of the historic background should appeal to a wider public than sanitarians and public health workers.

*Science News Letter, August 15, 1931*

## Travel-Ethnography

**CROSS ROADS OF THE JAVA SEA**—Hendrik de Leeuw—*Cape and Smith*, 350 p., \$3.50. "I was anxious to produce a travel book from which one could learn something," writes Mr. de Leeuw. Taking one by one the islands of Borneo, Java, Celebes, Sumatra, and Bali, he tells of the native festivals, manners, modes of reasoning and deep-rooted beliefs. He describes the problems of the Dutch in the islands, and tells of his own experiences. The narrative reads easily, and, to the reader's surprise, he finds himself learning quite a lot about these islands and their people—just as the astute Mr. De Leeuw intended all along.

*Science News Letter, August 15, 1931*

## Aeronautics

**MANUAL OF FLIGHT**—Capt. I. E. Elm—*David McKay*, 157 p., \$3. An illustrated instruction book, setting forth in a clear style the principles of flying. It contains much fundamental knowledge for one who intends to become a pilot, as well as interesting information for the air passenger. A dictionary of aeronautical terms is included.

*Science News Letter, August 15, 1931*

## Biography

**LAVOISIER**—J. A. Cochrane—*Constable*, 264 p., 7/6d. The part played by the great chemist in politics and the world of finance is not generally known. This book tells the surprisingly interesting story of Lavoisier's life and describes his work in chemistry and in the other fields in which he was active. It will appeal to those interested in general history as well as to chemists and students of chemistry.

*Science News Letter, August 15, 1931*

## Medicine

**ANNUAL MEDICAL REPORT**—*Chicago Tuberculosis Institute and Edward Sanatorium*, 461 p. Of interest to those professionally engaged in tuberculosis work. The chief medical activity of the Institute is its field work which is carried out through clinics in Cook County.

*Science News Letter, August 15, 1931*

## Botany

**PROCEEDINGS OF THE CELEBRATION, HELD AT THE MISSOURI BOTANICAL GARDEN, ST. LOUIS, OCTOBER 31 TO NOVEMBER 1, 1930, OF THE THREE HUNDREDTH ANNIVERSARY OF THE FIRST RECOGNIZED USE OF CINCHONA**. *Missouri Botanical Garden*, 258 p., \$5.00. Besides having historical interest, this illustrated volume should be useful for reference, since cinchona is discussed from the standpoint of medicine, botany, history, chemistry, pharmacology and related sciences and industry.

*Science News Letter, August 15, 1931*

## Medicine-Public Health

**TYPHOID FEVER**—William Budd—*American Public Health Association*, 184 p., \$5. Dr. Budd's original essay on the nature, mode of spreading and prevention of typhoid fever was printed in London in 1874. This handsomely gotten up reprint has been brought out by Delta Omega as the first of a series of public health classics. It will be of interest to medical scientists and to public health workers.

*Science News Letter, August 15, 1931*

## Public Health

**ANNUAL REPORT**—*Commonwealth Fund*, 85 p. The report for 1930 shows that the Commonwealth Fund is continuing its good work in the field of public health and education.

*Science News Letter, August 15, 1931*

## Medicine

**TREATMENT OF BEHAVIOR DISORDERS FOLLOWING ENCEPHALITIS**—Earl D. Bond and Kenneth E. Appel—*Commonwealth Fund*, 163 p., \$1.75. An extremely interesting account of the important experiment in re-education which has been carried out at the Pennsylvania Hospital since 1924. Physicians, psychiatrists, nurses, teachers, social workers and parents will learn from it much of value on how to handle this difficult type of behavior disturbance.

*Science News Letter, August 15, 1931*

## General Science

**WORKBOOK FOR USE WITH THE SCIENCE OF EVERYDAY LIFE**—Edgar F. Van Buskirk and Edith Smith assisted by James R. Wilson—*Houghton Mifflin*, 215 p., 72c. A supplement to one of the general science texts which should make classroom work more interesting.

*Science News Letter, August 15, 1931*